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| 10/508,969 | 04/08/2005 | Tomoyuki Nakano | KOD175B.001APC | 7613 |

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| EXAMINER | |
|---|---|
| CORDRAY, DENNIS R | |
| ART UNIT | PAPER NUMBER |
| 1731 | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | NOTIFICATION DATE | DELIVERY MODE |
|---|---|---|
| 3 MONTHS | 05/01/2007 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 05/01/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/508,969 | NAKANO ET AL. | |
| | Examiner | Art Unit | |
| | Dennis Cordray | 1731 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *15 February 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's amendments filed 2/15/2007 add new matter to claim 1, as discussed below. However, in the event that the amendments are not found to contain new matter, new grounds of rejection are also made as detailed below.

With regard to the electric charge exhibited by the polymers of Winiker, one of ordinary skill in the art would have had at his or her disposal the teachings of Alfrey, Jr. et al (J. Am. Chem. Soc.) that amphoteric copolymers of methacrylic acid and dimethylaminoethyl methacrylate exist as polycations (positive potential) at low pH and as polyanions (negative potential) at high pH, where the crossover point from cationic to anionic behavior, the isoelectric point, occurs at an intermediate pH (Abstract). The number of anionic or cationic charges on the polymer determines the maximum possible electric charge attainable. The presence of the uncharged acrylamide monomers has a negligible effect on these teachings but does affect the molecular weight and thus the charge density of the polymer. The electrical charge on the polymer will be less than or equal to the amount defined by the number of anionic or cationic monomers in the polymer.

The maximum positive or negative charge attainable for examples of polymers encompassed by the disclosure of Winiker can be calculated. For example, Winneker discloses acrylic acid as a suitable anionic monomer and dimethylaminopropyl acrylamide quaternized with methyl chloride as a suitable cationic monomer (col 6, lines 1-4; col 10, lines 30-34), which are both encompassed by the instant Disclosure on p 4,

lines 6-15. A copolymer of 90 mole percent acrylamide and 5 mole percent each of the above anionic and cationic monomers, which falls within the disclosure of Winiker, contains a maximum of 5 anionic and 5 cationic charges for each 7780 grams, or a maximum positive or negative electric charge of 0.56 meq/g. Using 74 mole percent acrylamide and 13 mole percent each of the above anionic and cationic monomers, also within the disclosed ranges of Winiker, the maximum possible positive or negative charge is about 1.5 meq/g. Both examples give maximum attainable values for the positive or negative electrical charges that are within the claimed ranges. Thus, in some embodiments, the polyacrylamides of Winiker have or, at least, it would have been obvious to one of ordinary skill in the art to obtain the claimed electric charge.

The Examiner agrees that there are some embodiments of Winiker that can have electrical charges outside of the claimed ranges. However, as discussed above, some embodiments lie within the claimed ranges and it would have been obvious to one of ordinary skill in the art to use any of the disclosed embodiments as functionally equivalent options or, in the alternative, to determine the optimum polymer composition by routine experimentation.

Regarding the claimed molecular weight, no evidence has been presented that the claimed broad range of molecular weight results in special advantages over that of Winiker. No data are provided in the examples with regard to the molecular weight of the polymers used. Given the broad range and indistinct endpoints disclosed by Winiker (in the area of 100,000 to 2,000,000), one of ordinary skill in the art would not have expected a polymer having a molecular weight of 2,500,000 to have a significantly

different character or effect than one having a molecular weight of 2,000,000. Absent evidence of special properties provided by polymers in the claimed range, the Examiner considers a molecular weight of "in the area of 100,000 to 2,000,000 to border on or touch the claimed range of "2,500,000 or higher."

Regarding the arguments that Winiker is silent as to bulkiness without affecting density and good optical characteristics, the density and optical characteristics are not claimed and the bulkiness is recited only in the preamble, which carries no patentable weight as it does not place a further limitation on the polymer or other additives as claimed.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 1, as amended, contains the limitation "a said amphoteric polyacrylamide having an average molecular weight of 2,500,000 or higher." The originally filed Specification recites on p5, lines 4-5 that the molecular weight of the polyacrylamides used in the present invention is between 2 and 4 million. Specifying a molecular weight

of 2,500,000 or higher includes molecular weights above 4 million, which is not embodied in the Specification.

Claims 2-15 depend from and thus inherit the new matter of Claim 1.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claim 1, 3-5, 7-8 and 10-15 are rejected under 35 U.S.C. 103(a) as unpatentable over Winiker (5032226) as evidenced by Alfrey, Jr. et al ("Amphoteric Polyelectrolytes. II. Copolymers of Methacrylic Acid and Diethylaminoethyl Methacrylate" J. Am. Chem.

Soc., V. 74 (1952) pp 438-441) and Alfrey, Jr. et al ("Preparation and Titration of Amphoteric Polyelectrolytes" J. Polymer Sci., V 23 (1957) pp 533-547).

Winiker discloses a base paper for photographic layer support comprising an amphoteric poly(meth)acrylamide copolymer (Abstract; col 3, lines 59-65). The copolymer, which has a molecular weight in the area of 100,000 to 2,000,000, comprises anionic monomers, cationic monomers, and acrylamide or methacrylamide monomers. Absent of evidence demonstrating special properties for polymers having the claimed molecular weight, a value "in the area of 2,000,000" could include molecular weights of 2,500,000 or, at least, it would have been obvious to one of ordinary skill in the art to use the claimed molecular weight without expecting any significant change on the paper of Winiker.

Winiker discloses that the molar ratio of acrylamide to cationic and anionic monomers is from 60:40 to 95:5 and the ratio of cationic to anionic groups is from 10:1 to 1:2. The copolymer is added to the paper pulp suspension in an amount from 0.3 - 3% by weight of the fibers (col 3, line 67 to col 4, line 17 and col 4: lines 38-41; col 6, lines 8-22). Anionic groups include carboxyl or alkalicarboxylate groups. Cationic groups include quaternary or protonized dialkyl aminoalkylkylene (meth)acrylate and dialkyl aminoalkylene (meth)acrylamide. The protonized forms are preferably sulfuric or hydrochloric acid salts. Quaternization can be achieved by dimethyl sulfate or methyl chloride (col 5,lines 43-68). A sizing agent used in the paper can be an epoxidized fatty acid amide (a fatty acid polyamide compound) (col 5, lines 3-6). Although Winiker discloses the sizing agent for providing hydrophobic properties, it can simultaneously

function as a bulking agent, thus producing a bulky paper. A wet strength resin is disclosed, thus the fibers can be crosslinked (bridged) (col 5, lines 31-42). The composition of the paper Winiker significantly overlaps that of the claimed paper. The paper can be printed on or made into a printing paper.

Winiker does not disclose the electric charge or potential of the copolymer as a function of pH.

Alfrey, Jr. et al (J. Am. Chem. Soc.) teaches that amphoteric copolymers of methacrylic acid and dimethylaminoethyl methacrylate exist as polycations (positive potential) at low pH and as polyanions (negative potential) at high pH, where the crossover point from cationic to anionic behavior, the isoelectric point, occurs at an intermediate pH (Abstract). Alfrey, Jr. et al (J. Polymer Sci.) discloses titrations of several copolymers of containing from 27 to 88 mole percent of dialkylaminoethyl (meth)acrylate with the remainder being (meth)acrylic acid (pp 534, 536 and 537). At a pH of 2, the electric charge for the titrated copolymers ranged from 2 to between 5 and 6 meq/gm and at a pH of 12, the electric charge ranged from 1 to 6 meq/gm.

The anionic and cationic monomers disclosed by Alfrey, Jr. et al are included in the list of suitable monomers of the instant invention as well as in the paper of Winiker. The compositions tested by Alfrey, Jr. et al fall within the cationic to anionic monomer ratio disclosed by Winiker. By diluting the copolymers of Alfrey, Jr. et al to contain 60 to 95% (meth)acrylamide monomers, as disclosed by Winiker, the electric charge will be reduced to less than 2 meq/gm at pH values of 2 and 12. Thus the amphoteric

polyacrylamide of Winiker thus possesses or, at least, it would have been obvious to one of ordinary skill in the art to obtain the claimed electric charge at a pH of 2 and 12.

Alternatively, a calculation of the maximum positive or negative charge attainable for polymers encompassed by the disclosure of Winiker. Winneker discloses acrylic acid as a suitable anionic monomer and dimethylaminopropyl acrylamide quaternized with methyl chloride as a suitable cationic monomer (col 6, lines 1-4; col 10, lines 30-34), which are both encompassed by the instant Disclosure on p 4, lines 6-15. As an example, a copolymer of 90 mole percent acrylamide and 5 mole percent each of the above anionic and cationic monomers, which falls within the disclosure of Winiker, contains a maximum of 5 anionic and 5 cationic charges for each 7780 grams, or a maximum positive of negative electric charge of 0.56 meq/g. Using 74 mole percent acrylamide and 13 mole percent each of the above anionic and cationic monomers, the maximum possible positive or negative charge is about 1.5 meq/g. Thus, for some embodiments of Winiker, the polyacrylamides have or, at least, it would have been obvious to one of ordinary skill in the art to obtain the claimed electric charges at the claimed pH values.

The paper of Winiker will have the claimed relative bonding area because, where the claimed and prior art apparatus or product are identical or substantially identical in structure or composition, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). In other words, when the structure recited in the reference is substantially identical to that of the claims, the claimed properties or functions are presumed to be inherent.

4. Claims 1, 4-5 and 7-15 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Honig et al (5167766) as evidenced by Alfrey, Jr. et al ("Amphoteric Polyelectrolytes. II. Copolymers of Methacrylic Acid and Diethylaminoethyl Methacrylate" J. Am. Chem. Soc., V. 74 (1952) pp 438-441) and Alfrey, Jr. et al ("Preparation and Titration of Amphoteric Polyelectrolytes" J. Polymer Sci., V 23 (1957) pp 533-547).

Honig et al discloses a process for making paper comprising adding high molecular weight organic microbeads in combination with a high molecular weight synthetic polymer to the furnish as a drainage and retention aid. The high molecular weight synthetic polymer is added in the amount of 0.05 to 20 lbs/ton (0.025 to 1% of the dry weight of the furnish solids) (Abs; col 3,lines 11-32). The high molecular weight synthetic polymer has a molecular weight from 100,000 to 25,000,000 and comprises from 0 to 99 mole percent acrylamide and from 1 to 100 mole percent anionic and cationic monomers (col 8, lines 23-32). Thus, in some embodiments, the synthetic polymer is amphoteric. Suitable cationic monomers are dialkylaminoalkyl(meth)acrylates, dialkylaminoalkyl(meth)acryamide and their quaternary salts (e.g. (meth)acrylamidopropyltrimethylammonium chloride). Suitable anionic monomers are (meth)acrylic acid, maleic acid or other dibasic acids (col 5, line 25 to col 6, line 2).

Although Honig et al discloses the use of the high molecular weight synthetic polymer for drainage and retention properties, it can simultaneously function to provide the other claimed properties.

Honig et al discloses that paper is made (cols 19-21; Examples 18-22). Any paper can be printed on.

Honig et al does not disclose the electrical charge of the polyacrylamide as a function of pH. The teachings of Alfrey, Jr. et al are as discussed above. It was thus known to those of ordinary skill in the art that amphoteric polymers exhibit positive, negative or neutral electrical charge as a function of pH. The same calculations previously detailed for the polymers of Winiker can be performed for those disclosed by Honig et al. The same monomers and amounts as used for the previous calculation are also embodied by Honig et al, and the same result is obtained. Thus, for some embodiments, the polyacrylamides of Honig et al have or, at least, it would have been obvious to one of ordinary skill in the art to obtain the claimed electric charges at the claimed pH values.

The composition of the paper Honig et al significantly overlaps that of the claimed paper. The paper of Honig et al will have the claimed relative bonding area because, where the claimed and prior art apparatus or product are identical or substantially identical in structure or composition, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). In other words, when the structure recited in the reference is

substantially identical to that of the claims, the claimed properties or functions are presumed to be inherent.

5. Claims 2 –4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Winiker or Honig et al , as applied above, in view of Tashiro et al (4935097) and Schade et al (2002/0182379).

Winiker does not disclose addition of amorphous silicate to the paper.

Tashiro et al teaches that paper for a photographic support requires rigidity and that it is known to enhance the rigidity of paper by making it bulky (col 1, lines 9-27). Tashiro also discloses that a paper with enhanced rigidity can be made into a printing paper (col 2,lines 63-66). Schade et al teaches that printing base paper requires high bulk for good ink penetration (p 2, par 26). Thus, it is known in the art to use a bulky paper for both photographic support paper and for printing paper.

Various methods used in prior art for enhancing the bulk of paper are taught in the Background section of the instant Disclosure (p 1, lines 15-26), including adding an amorphous silicate having a density of 0.3 g/ml or less, using mercerized fibers and adding bulking agents.

The art of Winiker, Tashiro et al, Schade et al and the instant invention are analogous as pertaining to bulky paper. It would have been obvious to one of ordinary skill in the art to enhance the bulk of the paper of Winiker in view of Tashiro et al and Schade et al to make it more rigid or to improve the ink penetration during printing. It

would also have been obvious to use any of the prior art methods for enhancing the bulk of the paper.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Cordray whose telephone number is 571-272-8244. The examiner can normally be reached on M - F, 7:30 -4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DRC

ERIC HUG
PRIMARY EXAMINER